

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

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1. A method of translating device layout data into a format for use by a mask writing tool, comprising the acts of:
reading a file that defines a number of cells used to produce a device;
selecting one or more of the cells;
creating one or more modified cells based on the interaction of the selected cells with other cells in the device layout data; and
creating a description of the modified cells as well as their placements on the mask in a format that is readable by the mask writing tool.
2. The method of Claim 1, wherein the extents of at least some of the descriptions of the modified cells to be written on the mask overlap.
3. The method of Claim 1, wherein the step of creating one or more modified cells, further comprises the act of:
creating one or more additional cells that create structures on the mask that are not created by writing the descriptions of the modified cells and prevent extraneous structures from being created on the mask when descriptions of the modified cells are written.
4. The method of Claim 1, further comprising the act of:
creating one or more additional cells that create structures on the mask that are not created by writing the descriptions of the modified cells and prevent extraneous structures from being created on the mask when descriptions of the modified cells are written.
5. The method of Claim 1, wherein the selection of cells is limited to cells that are repeated in the device layout data.
6. The method of Claim 1, wherein each cell has a number of polygons that define structures to be created on the mask and wherein the selection of cells is limited to cells having a pattern of polygons that is repeated in the device layout data.

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7. The method of Claim 1, wherein each of the cells includes a number of polygons that define structures to be created on the mask and wherein the act of creating one or more modified cells includes the act of:

adding polygons to a selected cell that correspond to polygons from cells that overlap the selected cell.

8. The method of Claim 1, wherein the act of selecting one or more cells further comprises the act of: selecting cells that maximize the area of the mask written with the descriptions of the selected cells and minimizes the time required to write the structures defined by the selected cells.

9. The method of Claim 1, wherein the act of creating a description of the modified cells further comprises the acts of:

determining if the mask writing tool is capable of transforming the description of a modified cell to orient it in a proper direction and creating a suitable description of the modified cell that the mask writing tool can transform to orient the description of the modified cell in the proper direction.

10. The method of Claim 1, wherein the method is executed using one or more computers.

11. The method of Claim 10, wherein at least one of the one or more computers has multiple processors, and cell selection and creation are executed using several processors simultaneously.

12. A method of creating a jobdeck for a mask writing tool, comprising the acts of:

reading a file that defines a device layout, the file including a number of cells that define structures to be created on a mask;

creating a set of cells in which at least two cells in the set have overlapping extents; the set of cells including:

one or more of the cells that are repeated in the device layout and that are modified to compensate for interactions with other cells in the device layout; and

one or more remainder cells that have structures that do not correspond to those in the modified cells and also contain areas to prevent extraneous structures on the mask from being created by writing files that correspond to the modified cells at selected locations on the mask;

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creating a set of mask writer files that correspond to the modified cells and the one or more remainder cells; and
generating a jobdeck for the mask writing tool that specifies the set of mask writer files and their locations on the mask.

13. The method of Claim 12, wherein the method is executed using one or more computers.

14. The method of Claim 13, wherein the one or more computers has multiple processors, and cell selection and creation are executed using several processors simultaneously.

15. A computer readable media having stored thereon a set of instructions for causing a mask writing tool to create a mask comprising:

a description of a number of files in a mask writer format the define structures on a mask, wherein at least two of the files have overlapping extents; and
a description of where each of the files should be placed on the mask.

16. A computer readable media having stored thereon:
a sequence of instructions that, when executed by a mask writing tool, causes the mask writing tool to write a number of overlapping files onto a mask in order to create a layer of a device.

17. A computer readable media having stored thereon:
descriptions of one or more repeated cells, each having patterns of polygons that correspond to structures that are repeated in a layer of a device;
a description of one or more remainder cells having polygons that, when written, create structures not created by writing the descriptions of the repeated cells, and areas that prevent the creation of structures on the mask that would be created by writing descriptions of the repeated cells.

18. The computer readable media of Claim 17, wherein:
the number of repeated cells include polygons that compensate for a cell's interaction with other cells that define structures in the layer of the device.

19. A computer readable media on which is stored instructions for execution by a mask writing tool to create a mask for a layer of a device, comprising:

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instructions to write sets of structures on the mask, at least some of the sets having extents that overlap; and

instructions of where each of the sets is to be written on the mask.

20. A method of operating a mask writing tool to produce a mask for a layer of a device, comprising the acts of:

reading a number of files, each of which define structures to be created on the mask;

reading a list of positions at which a corresponding file is to be written on the mask;

positioning a stage according to the list and writing a corresponding file;

reading a description of one or more remainder files that define structures on the mask that are not created by writing the files at the positions on the list and for preventing the creation of structures on the mask that would be created by writing the files at the positions on the list; and

positioning the stage and writing the one or more remainder files on the mask.

21. A computer readable media on which is stored a set of instructions for a mask writing tool to create a mask for a single layer of a device, comprising:

a number of files, each of which corresponds to a selected cell in a data layer of the device, wherein the selected cells are modified to compensate for each instance of the selected cell's interactions with other cells above and/or below the selected cell in the data layer in order to create the structures defined by cells above and/or below each instance of the selected cell in the data layer;

a description of a number of locations at which the files should be written; and

one or more files that define structures in the layer of the device that are not created by writing the files corresponding to the selected cells at the locations indicated.

22. A mask for creating a layer of a device that is created by the acts of: reading a series of files at least some of which define structures that are repeated in the device layer and some of which have extents that overlap;

reading a number of positions at which the series of files are to be written;

moving a stage to the positions indicated; and

writing the files and the positions indicated.

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23. A computer readable media on which is stored a sequence of program instructions that, when executed by a computer, will cause the computer to perform the acts of:

- reading a file that defines a number of cells for a layer of a device;
- analyzing the cells and selecting a number of the cells;
- modifying the selected cells to compensate for each of the selected cell's interaction with other cells;
- producing a number of files in a mask writing format that correspond to the modified, selected cells; and
- producing a list of positions in a mask writing format that indicates where the files are to be written on a mask.

24. A computer readable media on which is stored a sequence of program instructions that, when executed by a computer, causes the computer to perform the acts of:

- reading a device layout file that defines a number of cells of a layer in a device; and
- selecting a number of the cells, wherein at least some of the number of selected cells define structures in the layer that are repeated, wherein the selection is made such that the time required to write files corresponding to the selected cells is minimized and the coverage area of the files corresponding to the selected cells is maximized.

25. The computer readable media of Claim 24, further comprising instructions that cause the computer to:

- modify a selected cell based on the selected cell's interaction with other cells in the device layout.

26. The computer readable media of Claim 24, further comprising instructions that cause the computer to:

- create one or more additional cells that create structures in the layer not created by writing files that correspond to the modified cells.

27. The computer readable media of Claim 26, further comprising instructions that cause the computer system to:

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generate files in a mask writer format corresponding to the modified cells and for the one or more additional cells; and

generate a list in a mask writer format of where each of the files should be written on the mask to create the layer of the device.

28. A method of translating device layout data into a format for use by a wafer writing tool, comprising the acts of:

reading a file that defines a number of cells used to produce a device;

selecting one or more of the cells;

creating one or more modified cells based on the interaction of the selected cells with other cells in the device layout data; and

creating a description of each of the modified cells as well as their placements on the wafer in a format that is readable by the wafer writing tool.

29. The method of Claim 28, wherein the extents of at least some of the cells to be written on the wafer overlap.

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